MARINE REVIEW.

VOL. XI. CLEVELAND, O., MARCH 14, 1895. No. 11.

Liberal Appropriations.

The lakes certainly did not fare badly in the last session of the fifty-third congress. Although there was no river and harbor bill, a summary of appropriations made up from the civil sundry bill as it was finally signed by the president, shows $1,305,065 allotted to the lakes as follows:

For completing St. Mary's Falls canal improvement, ($483,865), and for 20-foot channel work ($500,000)	$ 983,865
For new aids to navigation, fifteen items	174,200
For completing revenue cutter for the lakes, for which $75,000 was appropriated in a previous act	100,000
For survey purposes and correction of charts under army engineer corps	27,000
Expenses of committee to confer with representatives of Dominion of Canada on feasibility of building canals to enable vessels in ocean commerce to pass to and from the lakes	10,000
Extension of marine hospital at Chicago	10,000
Total	$1,305,065

The new aids to navigation, sixteen in all, are as follows:

Maumee range light station, O.—For establishing a new beacon at each end of the range, to form a range both outward and inward in the line of the channel in Maumee bay, Lake Erie, $20,000.

Chequamegon point light and fog-signal station, Wis.—For moving and re-building the main La Pointe light and establishing a harbor bell and light at or near Chequamegon point, Lake Superior, $10,000.

Devils island light and fog-signal station, Wis.—For constructing a permanent tower, $22,000.

Grand Marais light station, Minn.—That of the unexpended balance of the appropriation made in the act approved March 3, 1885, for completing the construction of a light-house at Grand Marais, $4,000 may be applied to the purchase of a site for and construction of a light-keeper's dwelling at or near Grand Marais light station.

Detroit river lights, Mich.—For the completion of the lighting of the north and south ends of Grassy island, Detroit river, $6,700.

Eagle Harbor, Lake Superior, Mich.—For fog signal at Eagle Harbor, Lake Superior, $5,000.

At or near Squaw point, Little Bay de Noquet, a light, at a cost not exceeding $5,000.

Grand Marais harbor of refuge, Lake Superior, Mich.—For a light and bell at the Grand Marais harbor of refuge, now completed, on Lake Superior, $15,000.

Mendota, light station, Mich.—For re-establishing the light station at or near Medota, Bete Grise bay, entrance to Lac la Belle, Lake Superior, $7,500.

Portage Lake ship-canal pierhead fog signal, Mich.—For establishing a fog signal at Portage lake ship-canal pierhead light station, Lake Superior, $5,500.

Manitowoc light station, Wis.—For establishing a steam fog signal at Manitowoc pierhead light station, Lake Michigan, $5,500.

North Manitou light and fog signal station, Mich.—For establishing a light and fog signal station on North Manitou island, Lake Michigan, $20,000.

Porte des Morts range lights and fog-signal station, Mich.—For establishing range lights and a steam fog signal on or near Plumb island, in the Porte des Morts (Death's Door) passage, entrance to Green bay, Lake Michigan, $21,000.

South Fox island fog signal, Mich.—For establishing a steam fog signal at South Fox island light-station, Lake Michigan, $5,500.

Sturgeon Bay canal light station, Wis.—For establishing a light station at or near the entrance to the Sturgeon bay ship-canal, Lake Michigan, $20,000.

Sheboygan pierhead light station, Wis.—For establishing a steam fog signal at Sheboygan pierhead light station, entrance to Sheboygan harbor, $5,500.

Conference of Engineers.

A conference of representatives of the various branches of the Marine Engineers' Beneficial Association around the lakes was held in Cleveland on the 9th inst. Among the engineers present were National President Uhler, James W. Brooks of Buffalo, C. M. Stoddard and R. L. Peck of Cleveland, Thos. F. Dowd and Thomas Hunter of Chicago, Geo. McMonagle and Mr. Blanchard of Detroit, Jeremiah Havelack of Milwaukee, James Cummings of Muskegon, Martin Joyce of Ashtabula and Messrs. Irwin of Alpena and Mayer of Sandusky. Mr. Uhler presided and Mr. Peck of Cleveland was secretary. The proceedings were secret, but the engineers pronounced the conference a success. It is intended to hold a similar meeting next fall in advance of the national convention, in order that delegates from the lakes may be united on any subject of special interest to them coming before the national gathering.

Insurance Matters.

Among vessel men in Cleveland during the past few days were President Livingstone of the Lake Carriers' Association and Capt. J. W. Millen of Detroit, M. M. Drake, J. J. McWilliams and George McLeod of Buffalo, C. W. Elphicke and Amassa Fitch of Chicago, and David Vance and J. V. Tuttle of Milwaukee. Capt. Drake and two or three others of those named are interested in one of the big steel steamers being built by the Cleveland Ship Building Company, and were looking after certain details pertaining to the boat, but others among the visitors were interested in matters pertaining to the publication of the Inland Lloyd's Register for 1895. The register will very probably contain a large number of changes in ratings and valuations. It is thought that when the underwriters come to considering tariffs this year there will not be many changes in those of 1894.

Western Metropolis and City of Buffalo.

Editor MARINE REVIEW: Could you tell me whether or not the old Southern Michigan Railroad line boats, Western Metropolis and City of Buffalo, were ever known to make 20 miles an hour, and if so under what conditions.

Harbor, O., March 12, 1895. M. SANFORD RICE.

Capt. E. M. Peck of Detroit, Thomas Fitzpatrick of Cleveland and others among the older lake vessel owners say that the Western Metropolis was the fastest steamer that has ever been engaged in lake service. Her fastest run between Buffalo and Cleveland, pier to pier, 180 miles, was made in 1856, and the time was 9 hours and 5 minutes, or a very small fraction less than 20 miles an hour for the entire trip, so that the steamer might well be called a 20-mile boat. Mr. Thomas Fitzpatrick, who was engineer of the boat when this run was made, says the steam pressure was less than 50 pounds, although she could have carried and was allowed 55 pounds. The Western Metropolis was 325 feet over all and had beam engines, 76¼ inches diameter of cylinder and 12 feet stroke. Her firebox boilers—there were two of them—were 12 feet diameter and 32 feet long. The boiler room was air tight, and the condition of the atmosphere in it, caused by blowers forcing cold air through a system of pipes from another part of the hold, was such that grates under the fires might be touched without burning the hand. The Western Metropolis had iron wheels of 38 feet diameter, which were on several occasions turned at a speed as high as twenty-one times in half a minute. Her engines were built by Merrick & Towne of Philadelphia.—EDITOR.

New Revenue Cutters.

Officers of the revenue cutter service, who have been waiting for additional appropriations from the congress just adjourned before calling for bids on boats contemplated for the service for some time past, now have at their disposal $175,000 for a steamer for the lakes and a like amount for a boat for the New England coast. They also have $75,000 with which to begin the construction of a boat for the Pacific coast, that is to cost $200,000, and $50,000 for the construction of a smaller craft to be used in the harbor of San Francisco.

There is nothing new to be written regarding the outlook for freights. The continuance of a heavy consumption of Bessemer ores adds to assurances of an increased demand for standard ores next season, but the position taken by the sales agents is now, more than ever, indicative of delay in the matter of making contracts. Some reports from the northwest are to the effect that a large amount of soft coal is to carried over again in the spring, on account of a light business among the railways during the winter, but it is yet a little early to make a definite statement in this regard.

Side Lights of Lake Vessels.

(By F. D. Herriman, Chief Inspector, American Lake Department, Bureau Veritas.)

In my daily movements aboard lake vessels I notice faulty fitting of side light screens. I do not wish to have it appear that I am trying to find fault with lake shipmasters or their methods, and on this account I hesitate about referring to such matters, but of all the articles constituting the rules of the road recently enacted for the lakes, it would seem to me that there are none more important than rule 3, covering side lights. The sections of this rule pertaining to the fitting of green and red lights are the same as they have been for a great number of years. They are the same as the rules applying to seagoing vessels, but very brief as compared with the British board of trade rules on the same subject.

But wanting as rule 3 may be in matters of detail, there are but few, if any, of our lake vessels that have complied with the act as set forth, in regard to the location and fitting of these lights, and they would, in accordance with this law for the lakes, as well as for the high seas, be liable for damages by collision where side lights are in question. The substance of that part of rule 3 pertaining to side lights is as follows: On the starboard and port sides a green and red light, respectively, "so constructed as throw an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam, and of such a character as to be visible at a distance of at least two miles."

Fig 1

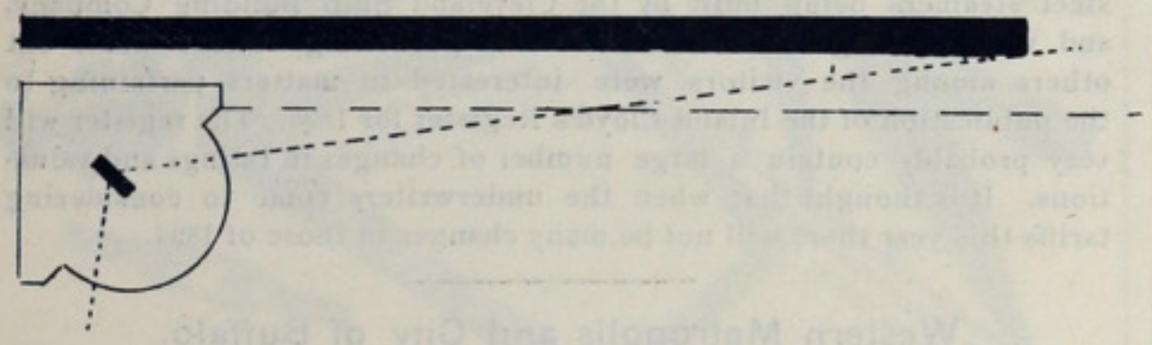


Fig 2

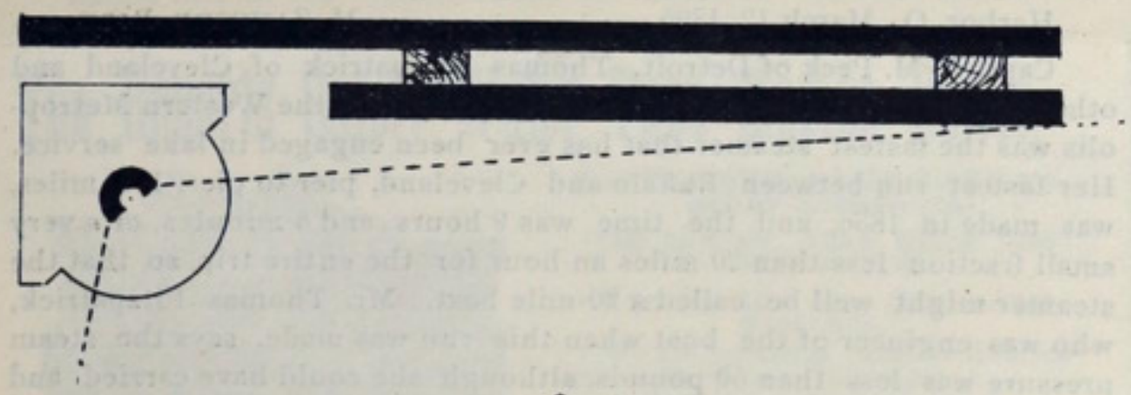


Fig 3

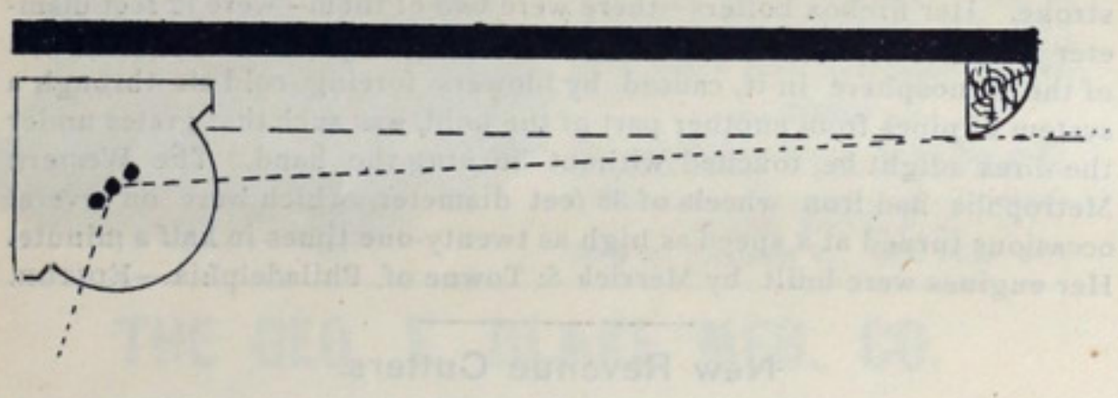
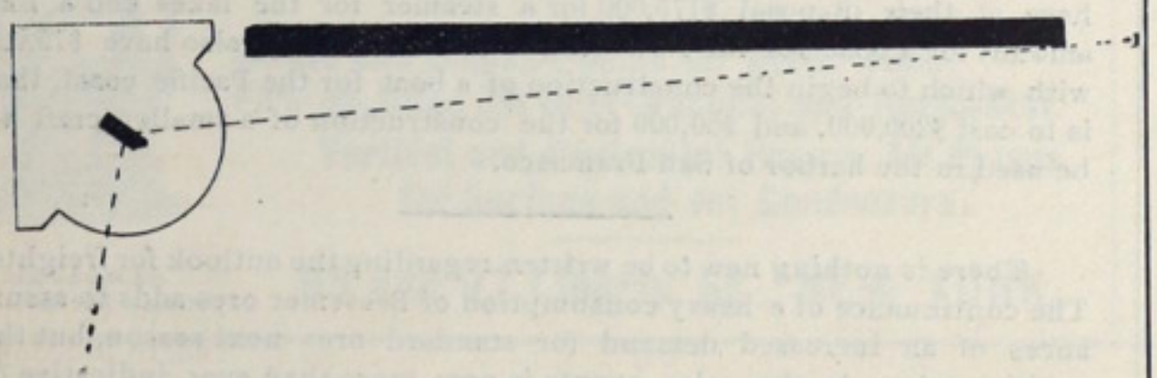
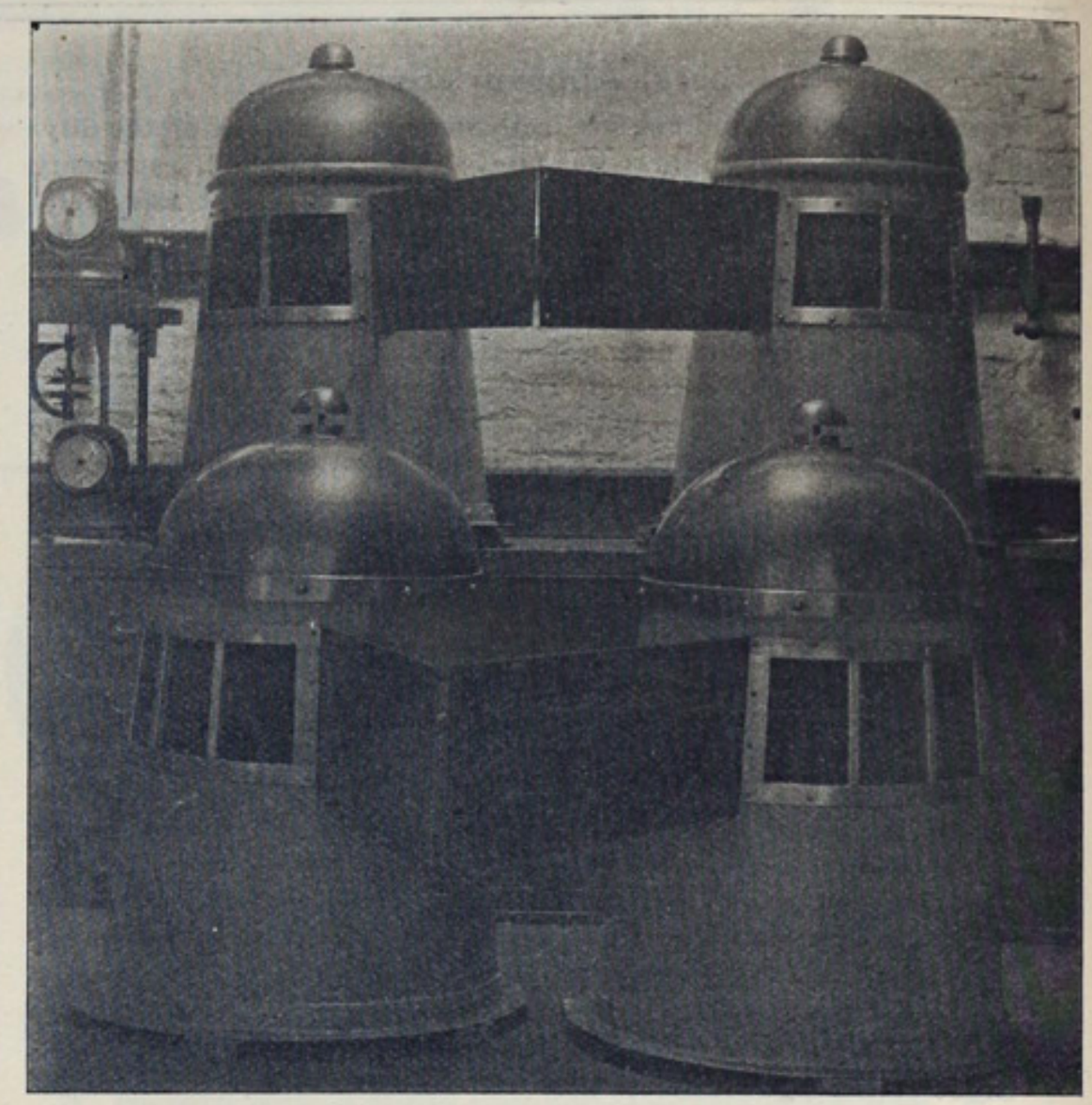


Fig 4



It does not fix what the dimensions of the lantern or lens shall be, or whether the lens shall be dioptic, plano convex or plain glass. Fish globe glass may be substituted if in the opinion of the purchaser a light with such a covering can be seen two miles. Now the reader has only to step aboard almost any of our lake steamers to satisfy himself that the law in regard to the fitting of the light screens is disregarded and the owner amenable in case of collision where these lights are in question.

If not asking for too much of your valuable space, it may be of service to those interested, who from press of business or other causes have not



SIDE LIGHT-HOUSES FOR SHIPS.

given the matter due attention, to quote instructions to surveyors, as given by the English board of trade for the proper and lawful fitting of the screens for the red and green side lights. I quote from these rules:

"In inspecting or surveying the lanterns of the red and green lights, special care should be taken that they are so fixed as to throw the light from right ahead to two points abaft the beam, and that they be placed outboard the extreme beam of the vessel. The inboard screens shall project at least 3 feet forward from the lights, or such greater length as the position of the light with regard to the screen and its distance from the ship's head may render neccessary, bearing in mind that if the lantern is placed a few inches outside an ordinary straight screen of 3 feet in length, or even against such a screen, the ray of light will be found to cross the end of the screen so as to be visible to a vessel approaching on the opposite bow; see Fig. 1. The inboard screen should be so fitted as to prevent the red and green rays crossing too close to the ship. To prevent this the screen board may be lengthened, or another board may be placed outside it; see Fig. 2. Or a chock, equal in thickness to the distance between the inner edge of the lens and the side of the screen, may be secured to the forward end of the screen; see Fig. 3. Or again, the lamp may be so placed that the outside of the screen will come against the inner edge of the lens; see Fig. 4.

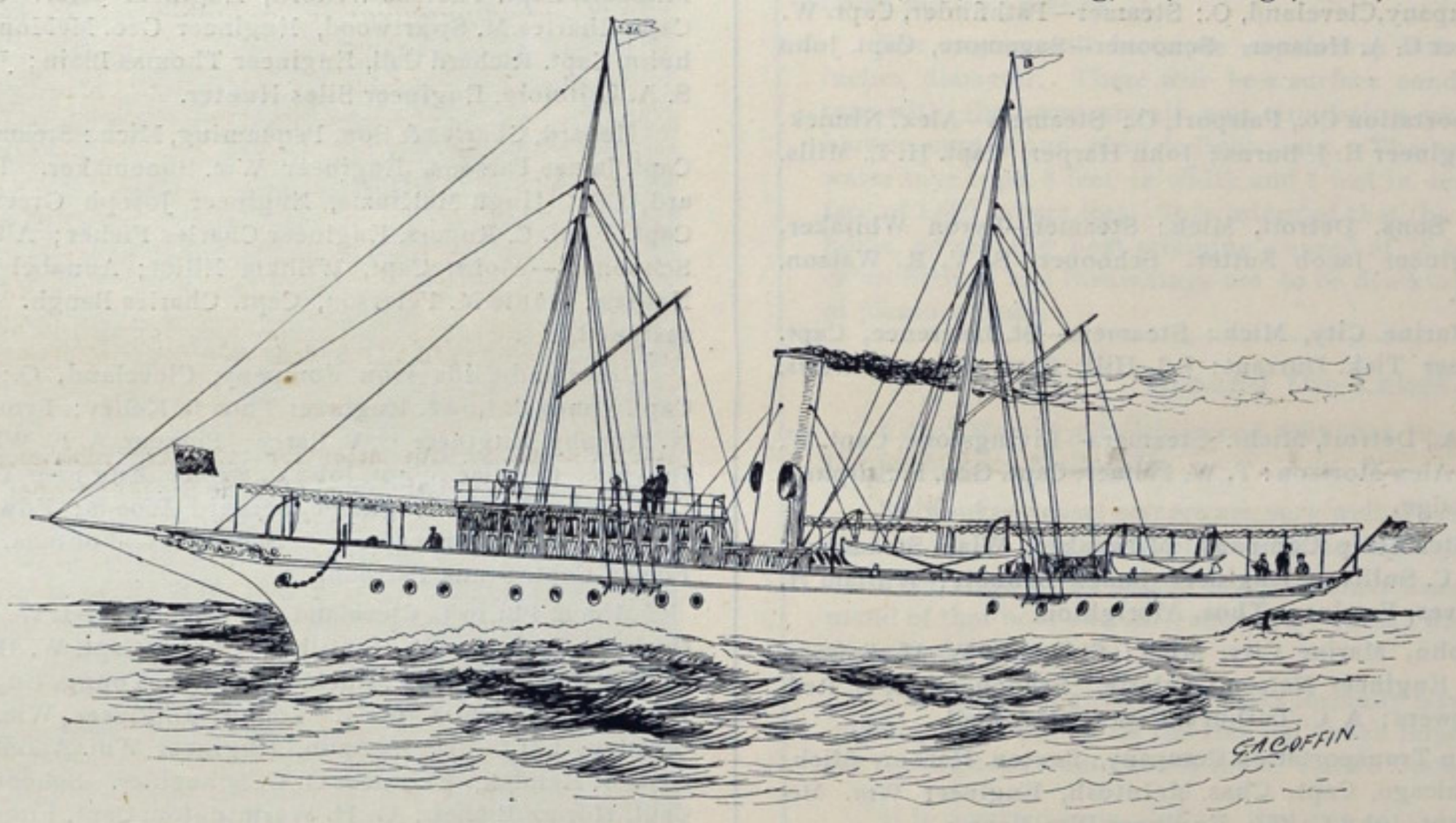
None of the above mentioned methods have been accepted by lake vessels that have come under the writer's notice. It has been my privilege to superintend the fitting of many side lights and their attendant screens on ships of various nationalities, and the simple method of placing the screens outside the extreme beam (where possible), and parallel with the keel of the vessel, with a chock on the forward end of the screen equal to the distance of the screen from the inboard end of the lens, has in every instance passed the required examination.

In connection with this reference to the fitting of side lights, it has occurred to me that probably some of the vessel masters or manufacturers of lights would be interested in the accompanying picture of steel light-houses. These steel light-houses are fast taking the place of the lanterns and screens on seagoing vessels, sail as well as steam. I have fitted many of these steel light-houses to American vessels in Liverpool, but I do not speak of them because of any interest in the manufacture of them. They may be made by any ship builder or manufacturer of lights at a moderate cost. These light-honses are most suitable and reliable for carrying side lights. They are fitted with steel screen boards, adjusted and secured by strong iron stays, and when once adjusted to the required regulations are always reliable. They are ornamental and can be entered from under the topgallant forecastle, from the second deck, or by a door in the side of the light-house.

Steel Steam Yacht for the Chicago Fleet.

George H. Warrington, Jr., secretary and treasurer of the Vulcan Iron Works, Chicago, has about completed designs for a steel steam yacht, to cost probably $90,000, for Mr. H. F. Balch of Minneapolis, and it is expected that contracts for the hull and machinery will be let about April 1, upon Mr. Balch's return from the south, where he has been spending a part of the winter. Detailed drawings are not all completed as yet, but the plans are sufficiently advanced to admit of a general description of the boat being given. Mr. Warrington, who is a naval architect and marine engineer, will have entire charge of the boat's construction, and his firm will doubtless build the engines and boilers, which latter will be of the Warrington patent water tube type, while the contract for the hull will very probably be given to the Chicago Ship Building Company. It is intended to have the boat completed in time to go down the Welland and St. Lawrence to the Atlantic late in the fall, so that her owner may spend next winter in the West Indies.

In general design the new boat will be of the auxiliary type, using both steam and sail. The dimensions are: Length over all, 135 feet; extreme beam, 17 feet; molded depth, 11 feet; draft, 8 feet. The displacement will be 144 tons. Steel will be used not only in the hull but on the decks and in the construction of all the houses above decks, the metal being covered at these points with mahogany. The purpose is to give the deck houses great strength to resist boarding waves when in the open sea. With two tubulous boilers giving steam to triple expansion engines of 12, 19 and 32 inches cylinder diameters and 18 inches stroke, it



STEEL STEAM YACHT DESIGNED FOR MR. H. F. BALCH, OF MINNEAPOLIS, MINN.

is expected that the boat will attain a speed of at least 18 miles an hour. In the way of canvas the yacht will carry a jib, jib topsail, staysail, mainsail, main gaff topsail, foresail, and a fore gaff topsail, giving it a total spread of 3,000 square feet. The canvas is spread from two spars 12 inches in diameter and 66 feet high above the deck, and a jibboom extending 22 feet from the rail. The coal bunker capacity is 32 tons, which is expected to carry the craft 3,000 miles at a speed of ten miles an hour. For longer cruises storage could be found for additional fuel.

On deck forward there is a companion house 8 feet in width and 31 in length, extending back to the engine roam. A semi-circular grand staircase leads from the forward end of the companion house to the dining salon below, which is 11 by 16 feet. Forward of the dining room the pantry is located on the port side and the galley on the starboard. Immediately aft of the dining room is the engine room, 13 feet long, and extending the full width of the ship. There the entire machinery of the craft will be located, and the engineer will have his stateroom. The boilers, which come next, occupy 23 feet of the ship lengthwise. Aft of the boilers are the owners' staterooms and bathrooms. In all they occupy a space of 9 by 17 feet, and are lighted through a skylight of beveled glass, 12 feet above the floor. The owners' stateroom opens out into the main salon, which is 12 feet long by the entire width of the ship, and which is also lighted by a skylight. Off the main salon there will be three staterooms for guests and a general toilet room. Being intended for long voyages, this boat will have comparatively little space devoted to deck houses. The captain's stateroom is in the after end of the companion house forward. This house is surrounded by a double high brass rail and will be the promenade deck of observation in pleasant weather. It is equipped with a search light. Following the ocean idea, the wheelsman will not be housed in, but will be in the open air. All the wood work in the staterooms, saloons and deck houses will be of mahogany. The number of electric lights on the ship will be about 120. It is intended to use electricity for lighting the boat throughout, for cooking, for operating refrigerating machinery, for heating and cooling staterooms and for propelling the launch or small boat used in port.

Equalization of Salaries.

The full text of the act to equalize the salaries of steamboat inspectors, as signed by the president on March 1, is a follows:

Be it enacted by the senate and house of representatives of the United States of America in congress assembled, that the "act to amend section 4400 of title 52 of the revised statutes of the United States," approved August 7, 1882, be, and the same is hereby, amended by striking out from the first section thereof all after the word "aforesaid," in the fourteenth line of said section, also sections 2 to 6 inclusive, of said act.

Sec. 2. That section 4,414 of the revised statutes be amended to read as follows:

Sec. 4414. There shall be, in each of the following collection districts, one inspector of hulls and one inspector of boilers, namely: The districts of New York, N. Y., Boston, Mass., Philadelphia, Pa., San Francisco, Cal., Albany, N. Y., New London, Conn., Baltimore, Md., Buffalo, N. Y., Cleveland, O., New Orleans, La., Norfolk, Va., St. Louis, Mo., Dubuque, Iowa, Detroit, Mich., Chicago, Ill., Michigan, Mich., Milwaukee, Wis., Port Huron, Mich., Willamette, Ore., Portland, Me., Puget Sound, Wash., Savannah, Ga., Pittsburg, Pa., Oswego, N. Y., Charleston, S. C., Duluth, Minn., Louisville, Ky., Evansville, Ind., Memphis, Tenn., Nashville, Tenn., Cincinnati, O., Gallipolis, O., Wheeling, W. Va., Superior, Mich., Burlington, Vt., Apalachicola, Fla., Galveston, Tex., Mobile, Ala., and Providence, R. I.

The inspector of hulls and the inspector of boilers in the districts enumerated in the preceding paragraph shall be entitled to the following salaries, to be paid under the direction of the secretary of the treasury, namely: In districts inspecting one hundred steamers and less, to a salary of $1,200 per year each; in districts inspecting over 100 and less than 150 steamers, to a salary of $1,500 per year each; in districts inspecting 150 and less than 200 steamers, to a salary of $1,800 per year each; in districts inspecting 200 and less than 300 steamers, to a salary of $2,000 per year each; in districts inspecting 300 and less than 500 steamers, to a salary of $2,250 per year each; in districts inspecting 500 steamers and upward, to a salary of $2,500 per year each.

The supervising inspector-general shall report to the secretary of the treasury the number of inspections for the year next preceding the approval of this act and thereafter, at the end of each fiscal year, the number of steamers inspected in each local district in that year, which number shall be the basis upon which shall be determined the salaries to be paid to local inspectors for the following fiscal year, in the ratio described in the preceding paragraphs of this section. And, in addition, the secretary of the treasury may appoint, upon the nomination of the supervising inspector of the district, in collection districts where there are 225 steamers and upward to be annually inspected, assistant inspectors, at a salary, for the district of New York, of $2,000 a year each; for the districts of New Orleans, La, Philadelphia, Pa, Baltimore, Md., Boston, Mass., Chicago, Ill., Jacksonville, Fla., Bangor, Me., New Haven, Conn., and San Francisco, Cal., at $1,800 per year each; and for all other dis-

tricts at a salary not exceeding $1,600 a year each; and he may appoint a clerk to any such board at a compensation not exceeding $1,200 a year to each person so appointed. Every inspector provided for in this or the preceding sections of this title shall be paid for his actual and reasonable traveling expenses at the rate of 8 cents per mile, incurred in the performance of his duty, together with his actual and reasonable expenses for transportation of instruments, which shall be certified and sworn to under such instructions as shall be given by the secretary of the treasury.

Appointments of Masters and Engineers.

Inter-Lake Company, Cleveland, O.: Steamer—Kearsarge, Capt. R. McDowell, Engineer P. P. June.

Buckley & Douglas Lumber Company, Manistee, Mich.: Steamer—Edw. Buckley, Capt. Chas. Gnewuch, Engineer Richard Winkler.

Cummings, M. J., Oswego, N. Y.: Steamers—C. S. Parnell, Capt. P. Griffin, Engineer ——; Mont Eagle, Capt. W. Griffin, Engineer ——.

Leisk, Henry, Milwaukee, Wis.: Steamer—P. J. Ralph, Capt. H. Leisk, Engineer John J. Burns. Schooner—Harold, Capt. Thos. Leisk.

Hadley & Burdick, Toledo, O.: Steamer—Panther, Capt. T. D. Gibson, Engineer Lee Corns. Schooner—Massasoit, Capt. C. L. Goodsite.

Botsford, Wm., Port Huron, Mich.: Steamers—Colorado, Capt. Rob't McLeod, Engineer T. H. Birch; Osceola, Capt. John McLeod, Engineer L. T. Morrill.

Huron Barge Company, Cleveland, O.: Steamer—Pathfinder, Capt. W. B. McGregor, Engineer C. A. Heisner. Scnooner—Sagamore, Capt. John Weeks.

American Transportation Co., Fairport, O.: Steamers—Alex. Nimick, Capt. A. H. Reed, Engineer E. J. Burns; John Harper, Capt. H. L. Mills, Engineer——.

Whitaker, B. & Sons, Detroit, Mich.: Steamer—Byron Whitaker, Capt. A. Ames, Engineer Jacob Sutter. Schooner—S. V. R. Watson, Capt. Joseph Christie.

Morley, C. T., Marine City, Mich.: Steamers—St. Lawrence, Capt. Ralph Byrns, Engineer Tick. Durrant; J. J. Hill, Capt. John Andrews, Engineer Louis Britz.

Livingstone, W. A., Detroit, Mich.: Steamers—Livingstone, Capt. W. H. Wilson, Engineer Alex Morison: T. W. Palmer, Capt. Geo. F. Stilphen, Engineer Robt. B. Hodge.

West Division Steamship Company, Milwaukee, Wis.: Steamers—Fred Pabst, Capt. D. C. Sullivan, Engineer James Bennett; William H. Wolf, Capt. F. A. Graves, Engineer Thos. Albrighton.

Jenkins, Capt. John, Marine City, Mich.: Steamer—W. H. Sawyer, Capt. John Jenkins, Engineer Nelson Ganlette. Schooners—C. E. Redfern, Capt. Wyman Powers; A C. Turbury, Capt. J. C. Angell.

Graham & Morton Transportation Company, Benton Harbor, Mich.: Steamers—City of Chicago, Capt. Chas. McIntosh, Engineer Wm. McClure; R. C. Reid, Capt. John Griffin, Engineer Wm. Brown.

Northern Michigan Transportation Company, Chicago, Ill.: Steamers—Petosky, Capt. W. P. Robertson, Engineer Thos. Collins; City of Charlevoix, Capt. Wm. Finucan, Engineer Fred. D. Phillips.

Owen, J. Emory Transportation Co., Detroit, Mich.: Steamers—John Owen, Capt. E. F. Thorp, Engineer ——; J. Emory Owen, Capt. J. P. Young. Schooners—Michigan, Capt. F. J. Cadotte; Nicholson, Capt. Wm. Smith.

Marine Transit Co., Marine City, Mich.: Steamers—Toltec, Capt. Jas. Taylor, Engineer Chas. Pierce; Aztec, Capt. Jas. W. Baby, Engineer Amos Horton. Schooners—Miztec, Capt. H. S. Shackett; Zapotec, Capt. Peter Thomson.

Pennington, B. L., Cleveland, O.: Steamers—C. B. Lockwood, Capt. Richard Jollie, Engineer John B. Miller; George Spencer, Capt. Frank B. Powell, Engineer C. W. Stedman. Schooner—B. L. Pennington, Capt. E. M. Fuller.

Wallace, David, Lorain, O.: Steamers—Vega, Capt. F. H. Brown, Engineer Chas. Sterling; Vulcan, Capt. W. H. Wallace, Engineer John McMonagle; Robert Wallace, Capt. A. Oldorf, Engineer Edward Stoddard. Schooner—David Wallace, Capt. F. E. Ingraham.

Alger, Smith & Co., Detroit, Mich.: Steamers—Volunteer, Capt. Wm. H. Rolls, Engineer P. B. McCabe; Gettysburg, Capt. S. H. Currie, Engineer W. P. Wenner. Tugs—Torrent, R. H. Hackett, Engineer J. M. Cronenweth; J. W. Westcott, Capt. G. R. Howes, Engineer——.

Smith, Edward, Buffalo, N. Y.: Steamers—Thomas Cranage, Capt. John S. McLeil; City of Paris, Capt. E. D. Ballentine; City of Venice, Capt. J. P. Noughton; Samuel Marshall, Capt. August Jean, Engineer, A. Leith; Samoa, Engineer W. W. Stewart, Engineer Lewis Minnie.

Williams Transportation Company, South Haven, Mich.: Steamers—City of Kalamazoo, Capt. David Morris, Engineer Perry Knaggs; H. W. Williams, Capt. John Boyne, Engineer Alfred Green; Glenn, Capt. Frank Swails, Engineer John Larell; Lorain L., Capt. Joe Warner, Engineer Tom Jinkins.

Flint & Pere Marquette Railway Company, Ludington, Mich.: Steamers—No. 1, Capt. John Nolan, Engineer Geo. Depuy; No. 2, Capt. John Doyle, Engineer Chas. Wilcox; No. 3, Capt.——, Engineer——; No. 4, Capt. Jos. Russell, Engineer F. McLaren; No. 5, Capt. F. A. Dority, Engineer Robt. McLaren.

Hutchinson, John T., Cleveland, O.: Steamers—Germanic, Capt. J. McNeff, Engineer C. Price; Rube Richards, Capt. M. H. Place, Engineer C. F. Pomeroy; Queen of the West, Capt. J. DeBeau, Engineer Wm. Dent. Schooners—E. C. Hutchinson, Capt. L. G. Vosburgh; May Richards, Capt. T. K. Woodward.

Webb, H. J. & Co., Cleveland, O.: Steamers—Roumania, Capt. R. J. Cowley, Engineer Edward Prince; J. H. Outhwaite, Capt. Lewis Stone, Engineer R. A. Davidson; Iroquois, Capt. Thomas Jones, Engineer Martin Burns. Schooners—John J. Barlum, Capt. Harry Phillips; H. A. Barr, Capt. John McKeighan.

Moore, John W., Cleveland, O.: Steamers—J. W. Moore, Capt. Richard Neville, Engineer Walder; Louisiana, Capt. John Colter, Engineer Harry Stone; Marquette, Capt. Edward Chilson, Engineer H. T. McAuley; Colonial, Capt. J. H. Stover, Engineer George Masters; N. K. Fairbank, Capt. Truman Moore, Engineer T. Moore.

Cleveland Rolling Mill Company, Cleveland, O.: Steamers—Samuel Mitchell, Capt. Thomas Wilford, Engineer James Clancey; J. H. Wade, Capt. Charles M. Swartwood, Engineer Geo. McMonagle; William Chisholm, Capt. Richard Call, Engineer Thomas Blain; J. H. Devereux, Capt. S. A. Gillmore, Engineer Silas Hunter.

Hebard, Charles & Son, Pequaming, Mich.: Steamer—Charles Hebard, Capt. James Parsons, Engineer Wm. Shoemaker. Tugs—David L. Hebard, Capt. Hugh McKinzie, Engineer Joseph Greenleaf; Jay C. Morse, Capt. Fred. C. Rogers, Engineer Charles Fisher; Allenton, not assigned. Schooners—Aloha, Capt. William Elliot; Annabel Wilson, Capt. Dan. Nathan; Annie M. Peterson, Capt. Charles Baugh. Yacht—Morgan, not assigned.

Cleveland-Cliffs Iron Company, Cleveland, O.: Steamers—Pontiac, Capt. James B. Lowe, Engineer Thos B. Kelley; Frontenac, Capt. Samuel N. Murphy, Engineer E. V. Barry; Pioneer, A. E. White, Engineer E. J. Jenkins; Cadillac, Capt. John C. Symes, Engineer T. J. Rees; Kaliyuga, Capt. John Lowe, Engineer Bernard Woods; Edward S. Pease, Capt. Thos. Sloan, Engineer——. Schooners—Fontana, Capt. Henry Harris; Planet, Capt. Frank Parrson.

Minch, Philip J., Cleveland, O.: Steamers—I. W. Nicolas, Capt. Wm. Gerlach, Engineer W. H. Miller; Onoko, Capt. W. H. Johnson, Engineer John P. Klasen; Philip Minch, Capt. Wm. Young, Engineer Chas. Parsons; Horace A. Tuttle, Capt. C. Young, Engineer Wm. Donavan; John N. Glidden, Capt. Jos. Lampoh, Engineer Wm. Aikens; A. Everett, Capt. Geo. B. Kendall, Engineer O. G. Schneider. Schooners—Sophia Minch, Capt. Horace Fisher; G. H. Warmington, Capt. Frank Coles.

Minnesota Steamship Company, Cleveland, O.: Steamers—Maritana, Capt. J. P. Cottrell, Engineer Geo. Waterbury; Mariposa, Capt. F. D. Root, Engineer S. H. Miller; Masaba, Capt. C. H. Bassett, Engineer Geo. Arnold; Marina, Capt. E. B. McQueen, Engineer D. A. Black; Matoa, Capt. Alex. McFarland, Engineer W. W. Tyler; Maruba, Capt. Fred Hoffman, Engineer B. F. McCanna; Mariska, Capt. H. Zeland, Engineer F. A. Smith; Manola, Capt. H. C. McCallum, Engineer Macholm Jamieson. Schooners—Malta, Capt. William Holly; Marcia, Capt. T. J. Crowley.

Wilson Transit Company, Cleveland, O.: Steamers—Yuma, Capt. Dan Buie, Engineer John Skelley; Spokane, Capt. B. H. Jones. Engineer Jas. Derrig; Yakima, Capt. W. W. Dowley, Engineer Jas. McGuirk; Missoula, Capt. Wm. A. Williams, Engineer Peter Lamar; Wallula, Capt. C. J. Holmes, Engineer Elmer Ellsworth; Sitka, Capt. C. A. Benham, Engineer Elmer Ennis; Olympia, Capt. A. M. Sheppard, Engineer Fred Harmon; C. Tower, Capt. Towsley, Engineer A. Williams. Schooners—Yukon, Capt. Wm. Forbes; Wadena, Capt.——.

Mitchell & Co., Cleveland, O.: Steamers—Centurion, Capt. W. C. Brown, Engineer M. Toner; W. H. Gratwick, No. 2, Capt. M. P. Parsons, Engineer W. F. Sauber; Wm. F. Sauber, Capt. C. Petersen, Engineer Wm. Fetting; Robt. L. Fryer, Capt. B. D. Townsend, Engineer August Guy; John Mitchell, Capt. W. H. Cowin, Engineer P. Lavely; W. H. Gratwick, No. 1, Capt. R. Jackson, Engineer Frank Parker; Ed Smith, No. 1, Capt. C. D. Miller, Engineer Marshall Townsend; Ed. Smith, No. 2, Capt. Hoyt Townsend, Engineer Henry Graves; New steamer building at West Bay City, Capt. Chas. B. Galton, Engineer Ed Guy; Geo. T. Hope, Capt. N. B. Nelson, Engineer Chas. Gumlich. Schooners—J. C. Fitzpatrick, Capt. K. A. Jensen; Camden, Capt. J. S. VanRansellaer; Jos. Paige, Capt. Stephen Rose; Troy, H. C. Diem; S. E. Marvin, Capt. Wm. Brines; R. L. Fryer, Capt. Eli Jacques; C. J. Fillmore, Capt. N. C. Kendall; Angus Smith, Capt. Owen Townsend; Maria Martin, Capt.——.

Partial Collapse of a Corrugated Furnace Flue.

In the latest number of the Journal of the American Society of Naval Engineers, Assistant Engineer Charles H. Hayes, U. S. N., makes a report of the partial collapse, due to overheating and shortness of water, of a corrugated furnace flue, which occurred Oct. 10, 1894, at the works of the Bergner & Engel Brewing Company, Philadelphia. The flue was made by the Continental Iron Works, Brooklyn, N. Y., and formed part of a two-furnace boiler of the gunboat type, which was built by the I. P. Morris Company of Philadelphia. The Continental company is engaged extensively in the manufacture of corrugated furnaces for marine as well as land boilers.

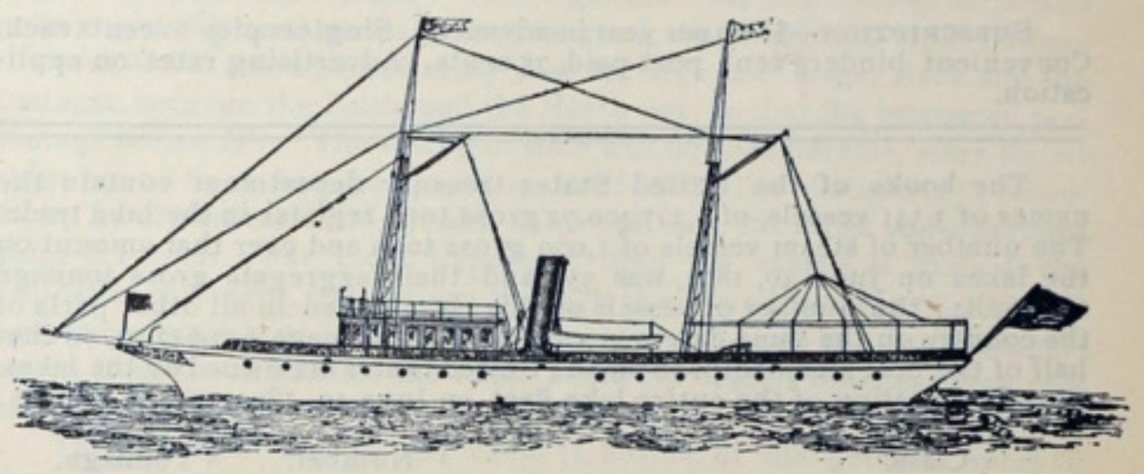
In this case the boiler was connected with four other similar ones, each of which was fed separately, all working at a pressure of from 90 to 100 pounds per square inch. At the time of the collapse, the pressure was about 90 pounds, and the fires moderately heavy with a good quality

of Atlantic bituminous coal. When the flue collapsed, the water had been out of sight in the glass for about thirty minutes, but the safety valve did not open at any time, either before or after the casualty. An examination of the furnace showed the thickness of the metal at the top of the corrugations to be .376 inch, between the corrugations .383 inch, and at the bottom of the depressions .353 inch, and gave indications of the water level having been about 10 inches below the crown. There were no rents, cracks or other defects visible on the depression, or on any other part of the furnace.

The other furnace began to go down in the same way, but there was only a depression about 2 inches deep on five of the corrugations. There was no leaking, and no other injury or defect was discovered in the boiler while making repairs. This collapse is chiefly noteworthy on account of the peculiar shape of the depression; showing the result of the pressure applied on the limited area about 8 inches wide and 4 feet 6 inches long on the overheated crown of the furnace, and also the excellent quality of the steel of which it was made as well as the integrity of the welding of the flue.

Another Valuable Steel Steam Yacht.

A small engraving of a steel steam yacht, which is being built by the Detroit Boat Works for Commodore Merrill B. Mills of the Detroit Yacht Club, is presented herewith. The boat is to cost about $70,000 and will be ready for service in July. Her length over all will be 132 feet, water line length 110 feet, beam on deck 17 feet 6 inches, and moulded depth 8 feet 9 inches. She will be schooner rigged with clipper bow, flush deck,



metal bulwarks about 12 inches above the deck, and a netted hand rail above the same. The hull will be constructed of the best quality of mild open hearth steel. She is to have three water-tight bulkheads, one in the bow and one at each end of the machinery. The decks will be made of clear white pine, in narrow width, faste ned to the steel deck frame by brass screws.

The engine will be triple expansion, with cylinders 10, 16 and 26 inches diameter. There will be a surface condenser of the salt-water type with the necessary air and circulating pumps, boiler feed pumps, blower engine and electric light plant. The boilers will be of Taylor's water tube type, 8 feet in width and 9 feet in length, with a heating surface of 1,600 square feet. It is intended that the engines will develop 350 horse power, the boat attaining a speed of 16 to 18 miles an hour. All cabin fittings and furnishings are to be of a kind suited to the best class of pleasure boats.

Around the Lakes.

Alfred Morrill of Collingwood, Ont., has begun the construction of a tug for Messrs. McDonald.

Milwaukee vessel owners are very well pleased with the new Wisconsin law, which grades vessel taxes according to the age of the property.

Capt. Brown, last season in the steamer Kearsarge, has resigned command of that boat and will, about July 1, take up the management of the Cleveland dry dock.

The Canadian government has formally issued the order in council placing boom sticks on the free list when imported into the dominion for towing logs from Canada to the United States.

It is reported from Buffalo that two of the five steamers of the Crescent line, which were leased by the Union Transit Company, a few weeks ago, are to be re-leased to the Clover Leaf (Lake Erie) line for $10,000 per year each.

In another part of this issue the light-house board advertises for bids on a composite steam light vessel. The boat is to be 112 feet long, 28 feet 6 inches breadth and 13 feet depth of hold. The engine will be of the surface condensing type, with a single cylinder. Plans and specifications are now ready and may be had from the light-house board, Washington, D. C.

The Wisconsin & Michigan Railroad Company has made a contract with Capt. James Davidson for the construction of two large car-transfers. The boats will be 316 feet over all, 44 feet beam and 20½ feet hold. They will be handled by a powerful tug and have four tracks, suited to twenty-four cars. They are to be completed in June, and will probably run between Peshtigo, Wis., and South Chicago.

T. J. Elderkin of Chicago, leader of the few scattering members of the Seamen's Union on the lakes, is trying to make up labor organizations in lake cities that will include wheelman, watchmen, cooks and stewards. He says that one of the first efforts of the new organization will be to "secure legislation compelling steamboats on the lakes to carry experienced crews of sufficient number to insure safety in the handling."

James Rooney of Toledo was the lowest bidder on a job of dredging in the straight channel at that place, for which Col. Jared A. Smith, United States engineer opened bids in Cleveland a few days ago. Carkin, Stickney & Cram of Detroit were lowest on a dredging job at Ashtabhla amounting to $28,857. On the work of removing a part of the west pier and constructing a new pier at Fairport, James B. Donnelly was the lowest bidder.

MARINE REVIEW

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O.

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,341 vessels, of 1,227,400.72 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons and over that amount on the lakes on June 30, 1894, was 359 and their aggregate gross tonnage 634,467.84; the number of vessels of this class owned in all other parts of the country on the same date was 316 and their tonnage 642,642.50, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1894, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels	1,731	843,239.65
Sailing vessels	1,139	302,985.31
Canal boats	386	41,961.25
Barges	85	39,214.51
Total	3,341	1,227,400.72

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
Year ending June 30, 1890	218	108,515.00
" " " 1891	204	111,856.45
" " " 1892	169	45,168.98
" " " 1893	175	99,271.24
" " " 1894	106	41,984.61
Total	872	406,976.28

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

(From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			SuezCanal.		
	1894.	1893.	1892.	1894.	1893.	1892.
No. vessel pass'ges	14,491	12,008	12,580	3,352	3,341	3,559
T'n'ge, net registd	13,110,366	9,849,754	10,647,203	8,039,105	7,659,068	7,712,028
Days of Navigat'n	234	219	223	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

PRESIDENT UHLER of the Marine Engineers' Beneficial Association was in Cleveland during the week, and in company with other representatives of the engineers from lake cities called upon Harvey D. Goulder, counsel for the Lake Carriers' Association, with a view to having the executive committee of that body consider certain requests from the engineers before establishing a schedule of wages for the coming season. The engineers asked for a conference with the owners. They especially desire the removal from the wages card of fixed rates of wages for engineers. Mr. Goulder will direct the attention of the executive committee to this matter and it is probable that the conference will be held although action on the question of wages will undoubtedly be delayed longer than usual this year. In connection with this visit of President Uhler to the lakes, and the conference with Mr. Goulder, which was of a business-like and common sense kind, it would seem that lake engineers might well ask to be delivered from such friends as the editor of the Engineer of New York, who assumes to talk for the association, and whose pessimistic disposition is enough to kill any effort that might be made to bring vessel owners and engineers into close relations.

THE MINISTRY of the Dominion of Canada has been asked by vessel owners using the canals to reduce tolls upon the Welland and St. Lawrence river canals. The present tolls are, no doubt, a great drawback to commerce in various articles of merchandise by waterway between the upper lakes and Lake Ontario and the St. Lawrence river. The canal toll on lumber eastward—none goes west—is 30 cents per thousand; the toll on coal, either eastward or westward, is 20 cents per net ton; on all classes of freight, except the classes of grain, viz.: wheat, rye, corn, barley and oats, the duty is 20 cents per ton either way; on the grains named the toll is 10 cents per ton. These rates of tolls, except those on grain, have existed the same for many years, while freight rates have dropped off to extremely low figures—3 cents a bushel, for instance, on wheat from Chicago to Ogdensburg. Neither are these rates of toll confined to the cargo, but the tonnage of the vessel itself is assessed at 1½ cents per ton. The attention of the ministry is being called to the disadvantages to which the commerce of the canals is now subjected, and it is to be hoped that the government will not only reduce the tolls on the Welland and St. Lawrence canals for next season but also decide to permit of the free passage of all vessels through the new canal at Sault Ste. Marie.

THE new British ship building programme provides for four first-class, four second-class and two third-class cruisers, twenty torpedo gunboats, and twenty torpedo boat destroyers. The first-class cruisers are to be improved Blenheims, and will be about 400 feet long, and have engines of 25,000 I. H. P., for a speed of 22 knots. The second-class cruisers will be improved Talbots, which latter are of 5,600 tons displacement, and they will have engines of 9,600 I. H. P., for a speed of 19½ knots. The torpedo gunboats will be larger than the Dryad class, and in all the new vessels a marked increase is made in the boiler power. The contract speed for the torpedo boat destroyers is to be 29 knots.

IN ANOTHER part of this issue Capt. F. D. Herriman, inspector of the Bureau Veritas, directs attention to the faulty fitting of the red and green side lights and their screens on lake vessels. Capt. Herriman discusses the question of side lights in a very interesting manner, and with a view simply to directing attention to a condition of these lights on lake vessels that might prove unsatisfactory in event of loss resulting from collisions or other causes.

Still Waiting for Medals and Diplomas.

Manufacturers and others who had exhibits at the World's Columbian Exposition have probably in some cases given up all hope of ever receiving the medals or diplomas that were promised to them. It is probable, however, that the slow grind of government detail connected with this work will soon be at an end, as the following extract from a letter recently received by McBean, Edge & Co. of Buffalo, from the committee on awards, would indicate:

"With regard to the medal and diploma awarded to you at the World's Columbian Exposition, I would state that the act of congress of August 5, 1892, made an appropriation for the preparation of the said medals and diplomas by the honorable secretary of the treasury direct, and this committee is therefore without responsibility in the matter until the same are delivered to us for distribution. The diplomas are being prepared at the bureau of engraving and printing, and the medals are being struck off under the supervision of the director of the mint. We have been unofficially advised by the last referred to official that the medals will be completed about may or June next. In considering the question of the time consumed in the preparation of these medals and diplomas, it should be borne in mind that the medals and diplomas radically differ from the stereotyped form of medals and diplomas which have been hitherto issued by expositions, in that each diploma granted to an exhibitor at the World's Columbian Exposition will contain a report of the individual judge as ratified by the department committee of which said individual judge was a member, showing the specific points of excellence and advancement possessed by the exhibit upon which such diploma is issued. Also the medal which will accompany the diploma will bear upon its face the name of the exhibitor to whom it is issued. Thus the diploma and medal will be unique and distinctive and possess a higher and greater value than the stereotyped form heretofore employed. It is obvious that medals and diplomas of this distinctive character will consume more time in their preparation than the stereotyped forms heretofore employed and in which such individual features are lacking."

St. Mary's Falls and Suez Canal Traffic.

The traffic of the great Suez canal is no longer to be compared with that of the St. Mary's Falls canal, which connects Lake Superior with other ports of the great lakes. Official reports of the traffic of the Suez in 1894 are at hand, and although they show an increase over the business of 1893, the net registered tonnage of vessels is more than 5,000,000 tons less than that of vessels passing the St. Mary's Falls canal during a navigation season of only 234 days in the same year. The figures are given in full at the head of this page. The number of vessels passing the St. Mary's Falls canal during 234 days of 1894 was 14,491 and their net registered tonnage 13,110,366, while the number of vessels for the full year passed through the Suez was 3,352 and the net registered tonnage only 8,039,105.

The Dry Dock Engine Works of Detroit has purchased from Mr. B. F. Sparr his rights in a patent propeller wheel for use on the lakes. Officers of the Detroit company say that results obtained by use of the wheel, where tried, have warranted them in taking hold of it, and they expect soon to urge its adoption. It is a wheel with three blades on one hub of varying diameter, the pitch forming a spiral. Great claims are made for the wheel and good reference given.

Twenty cents a copy will be paid for two copies each of Vol. V. Nos. 3 and 9, MARINE REVIEW, if mailed in good condition to 516 Perry-Payne Bldg, Cleveland, O.

Illustrated Patent Record.

SELECTED ABSTRACTS OF SPECIFICATIONS OF A MARINE NATURE—FROM LATEST PATENT OFFICE REPORTS.

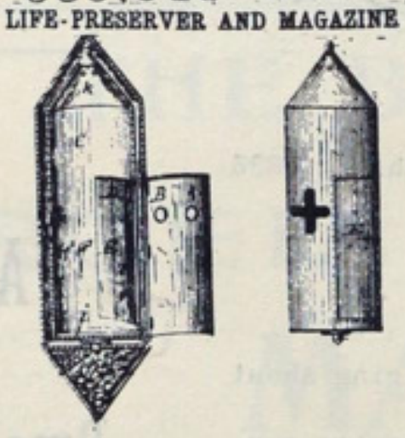
535,045. Combined Life Preserver and Magazine. Erasmus Bennett, Topeka, Kans. Filed March 31, 1894. Serial No. 505,875.

Claim—The combination of an outer stationary shield, having a side entrance and a series of port holes, with an inner revolving shield having a side entrance and a port hole so arranged that upon the rotation of the inner shield said port hole will register with any desired port hole in the outer shield. The outer stationary shield having a side entrance, a series of peripherally arranged port holes and the conical or pointed end pieces —the lower one of which is filled with fibrous material—in combination with the inner revolving shield having a port hole and side entrance.

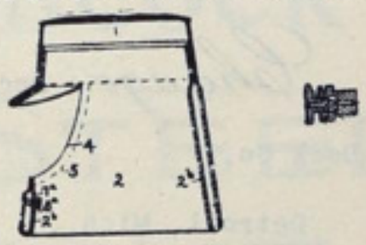
535,143. Life Saving Cap. Albert Mendelson, Cleveland, Ohio. Filed Aug. 11, 1894. Serial No. 520,063.

Claim—The combination, in a life saving cap, of the cap 1, the two thicknesses 2^a and 2^b of air tight material, arranged to form an air space between, constituting the cape 2, with a valve having the external groove 7^a, the internal chamber 9, and the passage 10, the walls of said chamber screw threaded, and the threaded valve stem 8 terminating in a thumb piece and provided with the passage 11 piercing the center of said thumb piece and opening into said chamber through the side of said stem.

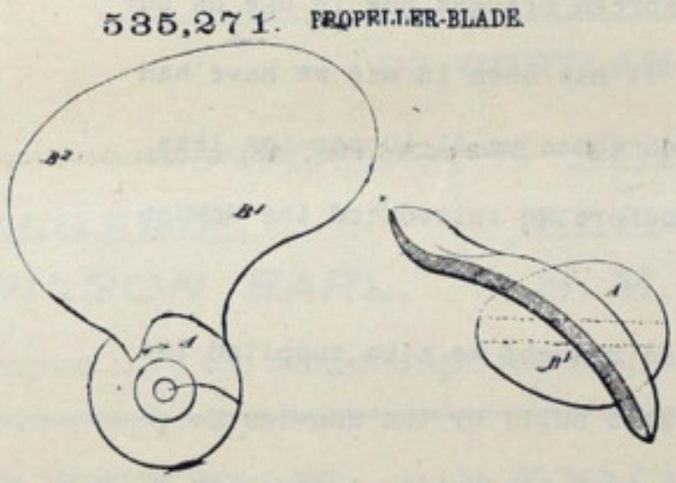
535,045. COMBINED LIFE-PRESERVER AND MAGAZINE



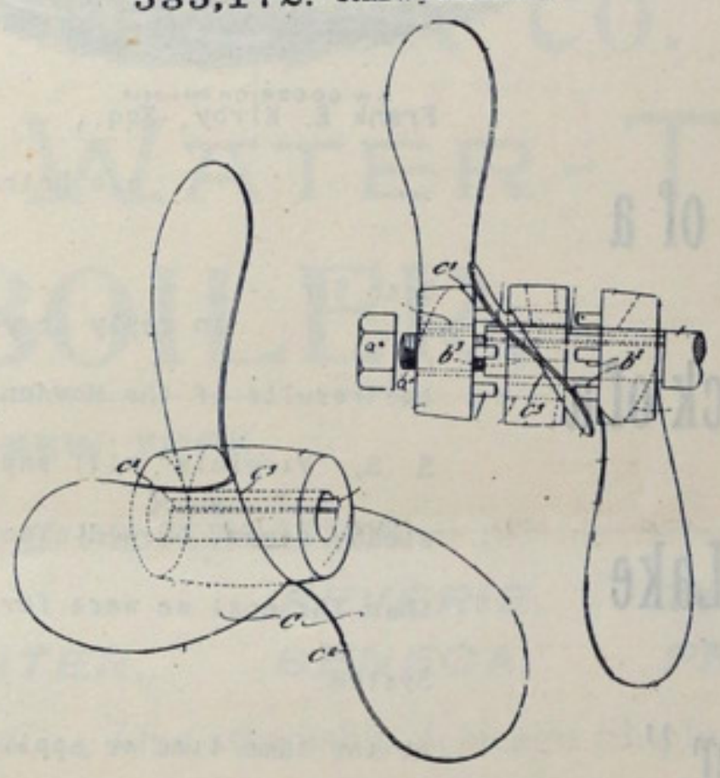
535,143. LIFE-SAVING CAP.



535,271. PROPELLER-BLADE.



535,172. SCREW-PROPELLER.



535,172. Screw Propeller. Charles R. Purnell, Philadelphia, Pa., assignor of one-half to Richard Shevlin, same place. Filed Nov. 16, 1894. Serial No. 528,973.

Claim—A screw propeller provided with a feathered shaft, internally grooved separable hubs locking by means of pins and openings mounted on said shaft, and each hub provided with a blade having convex and concavo-convex outlines and the said blades in normal position diagonally positioned to their hubs,one after the other, so as to act independently of one another in inducing a propelling force against a body of water.

535,271. Propeller Blade. Thomas Armstrong, London, England. Filed April 30, 1894. Serial No. 509,568.

Claim—A propeller blade composed of a segment or section of a hollow sphere and having on its rear edge a reversely curved rim or lip.

A Ship-Canal That is a Reality.

In these days of numerous ship-canal schemes, on paper, it is a pleasure to describe a canal that is a reality, and which was planned and built to serve a commerce that awaits its opening. The Baltic and North Sea canal, which is to be opened on June 20 by the German government, connects large bodies of water, alike to the Suez and St. Mary's Falls canals. The line of the canal starts at Kiel, on the Baltic Sea, and crossing the Prussian province of Holstein joins the Elbe at Brunsbuttel, below Hamburg. Work was begun on June 3, 1887, and over 8,600 men were employed during the summer months, while in winter the number was reduced to about 4,700. The plant comprised ninety locomotives, 2,473 cars, sixty-six dredgers, 133 lighters and fifty-five engines. The estimated cost was about $37,400,000, and the thoroughness of preparation and efficiency of execution can not be better illustrated than by mentioning the fact that the estimate has not been exceeded.

There will be two locks—one at the Baltic end, open all the year round, except during twenty-five days, and one on the Elbe, open three to four hours during every flood tide, so that it may almost be termed a tidewater canal. Its length is 53½ miles, average depth 29½ feet, width at bottom 72 feet, width at water level 213 feet. At Brunsbuttel, on the Elbe, there is an outer harbor 1,312 feet long by 328 feet wide, then follows the lock, 492 feet by 82 feet and 32⅘ feet deep, and then an inner harbor 1,640 feet by 656 feet. Two suspension bridges cross the canal nearly 138 feet above water level, so that railway traffic will not be interrupted.

The speed allowed on the canal will be 5.3 miles per hour, making the time of passage about thirteen hours. The toll will be 18 cents per net register ton, loading capacity. It is expected that about 18,000 ships will make use of the canal annually, representing about 7,500,000 tons. Hitherto about 35,000 ships passed every year through the Skager Rack and the Cattegat, between the Baltic and the North Sea, so that the estimated percentage seems fair. The saving of time will be considerable, since for all ships bound to or from any point south of Hull the distance will be reduced by 238 miles, while Bremen ships will save 322 miles and Hamburg ships 424 miles. But more important than the saving in time is the avoidance of danger, the passage through the sound between the Scandinavian peninsula and Jutland being considered one of the most dangerous in Europe. Statistics show that about 200 vessels founder every year on these coasts.

The strategic value of the canal is, beside, of the greatest value to Germany, because its men-of-war will be able to pass from the North Sea to the Baltic with ease and safety, avoiding the passage through foreign waters, and permitting rapid concentration on the north or the west coast.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store and afloat at the principal points of accumulation on the lakes on March 9, 1895:

	Wheat, bushels.		Corn, bushels.	
	In store.	Afloat.	In store.	Afloat.
Chicago	25,053,000	1,512,000	5,027,000	1,972,000
Duluth	11,187,000	85,000	1,000	.....
Milwaukee	669,000	.....	.....	.....
Detroit	1,308,000	257,000	152,000	.....
Toledo	2,609,000	299,000	868,000	.....
Buffalo	2,910,000	295,000	95,000	684,000
Total	43,736,000	2,448,000	6,143,000	2,656,000

Steel Production at Low Costs on the Lakes.

Judging by some of the figures talked of by those who are interested in new steel plants on the lakes, low costs of production have not yet reached their limit. These figures are not those of wild promoters, but are the estimates of men who have spent a lifetime in practical charge of some of our largest and most successful plants. Such men are thoroughly conversant with all the details and know what allowances must be made for contingencies. If their estimates of cost are correct, the plants located favorably on the lakes can put their products into the leading markets of this country at present prices and leave a very handsome profit. They foreshadow for many American collateral industries a continuance of low-priced crude materials which will make them lively competitors in the world's markets.—Iron Age.

The air-tight compartment theory of building ships was copied from a provision of nature shown in the case of the nautilus. The shell of this animal has forty or fifty compartments, into which air or water may be admitted to allow the occupant to sink or float, as he pleases.

"A DOLLAR SAVED IS A DOLLAR EARNED."

Results Obtained from the Application of

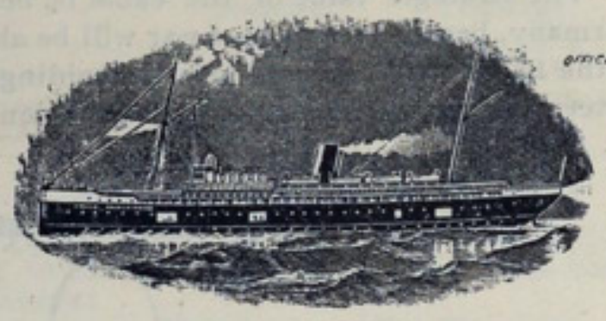
Howden's Hot Draft System

On the PASSENGER STEAMER VIRGINIA, (See Letter Below,)
And on the Coarse Freight Carrying STEAMER HARVEY H. BROWN,

show an immense saving in fuel. A ton of cargo carried a mile on 8-10 of an ounce of fuel, or a ton of cargo carried 170 miles at the rate of 13.2 miles per hour on a cent's worth of fuel, are performances that have been attained on but one steamer on the lakes—that steamer is the HARVEY H. BROWN fitted with **HOWDEN'S HOT DRAFT SYSTEM.**

"A Tale of a Smoke Stack of a Modern Lake Steamer."

Sent FREE to any Address.



OFFICE OF THE PRESIDENT.

GOODRICH TRANSPORTATION Co

FOOT OF MICHIGAN AVENUE.

A W GOODRICH, PRESIDENT

Chicago Dec. 20th, 1893.

Frank E. Kirby, Esq.,
c/o Detroit Dry-Dock Co.,
Detroit, Mich.,

Dear Sir --

In reply to your letter of the 18th inst. inquiring about the results of the Howden System of Forced Draught now in use on our S. S. "Virginia", will say that since it has been in use we have had steady steam, and burned slack coal, which costs us $1.10 per ton less than the coal we were forced to use before we introduced the Howden System.

At the same time we applied the Forced Draught we also supplied the "Virginia" with new Condensing apparatus built by the Knowles Co., which gives a better vacuum requiring much less steam to operate than the original plant supplied by the builders.

Our saving in the price of coal has been 50 o/o. We attribute 33 1/3 o/o of the saving to the Howden System, in enabling us to burn a cheaper grade of coal and maintain steady steam.

The balnace or 16 2/3 o/o we credit to the Condensers made by the Knowles Co.,

We are so well satisfied with the results on the "Virginia" that we have since fitted the "Atlanta" with the Howden System and are now putting it in the "City of Racine," and "Indiana."

Very truly yours
A W Goodrich Pres.

"A Tale of a Smoke Stack of a Modern Lake Steamer."

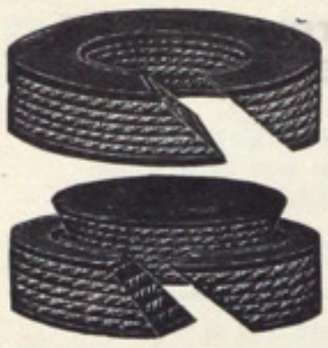
Sent FREE to any Address.

For further particulars, write the sole owners and manufacturers of the Howden apparatus for the lakes.

THE DETROIT DRY DOCK COMPANY,

SHIP AND ENGINE BUILDERS, **DETROIT, MICH.**

P. S.—**"A cent's worth of fuel, A ton of cargo, A hundred and seventy miles, At 13.2 miles per hour"** is the title of a book being prepared for this company. If you would like a copy, send your name and address.



GARLOCK PACKINGS.

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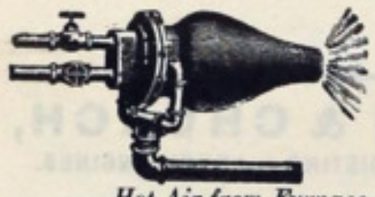

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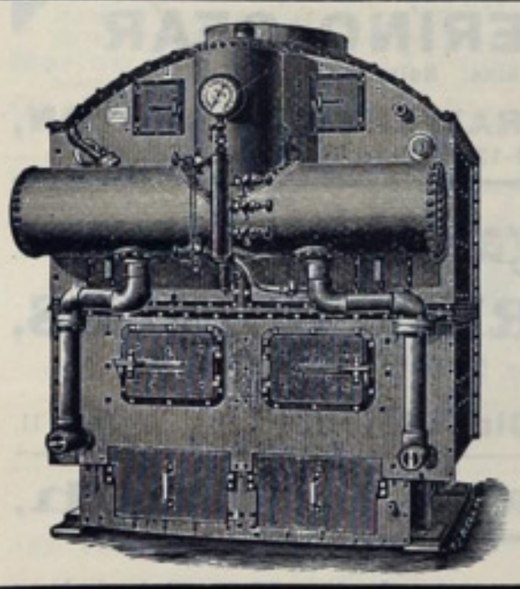

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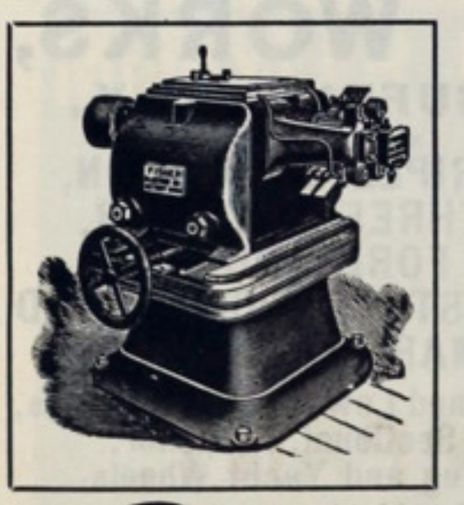

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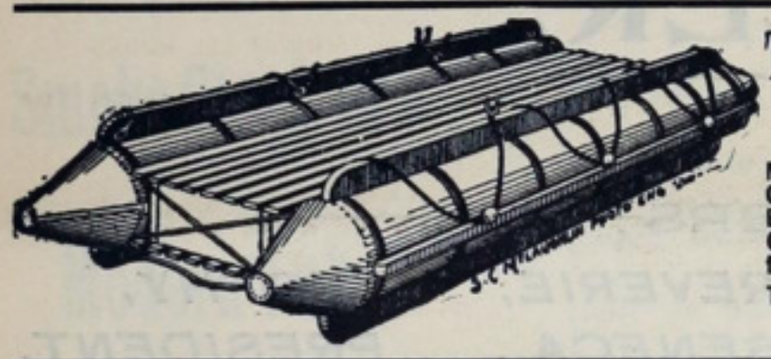

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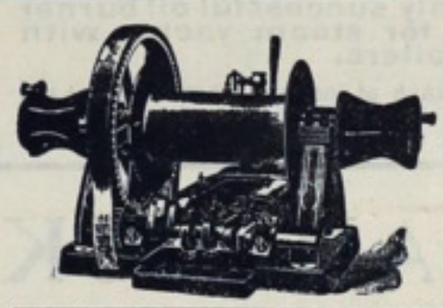

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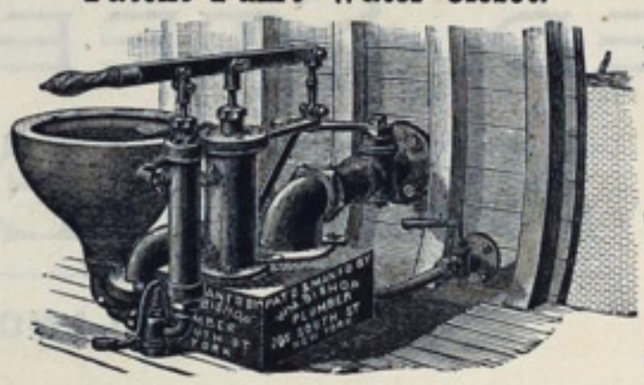

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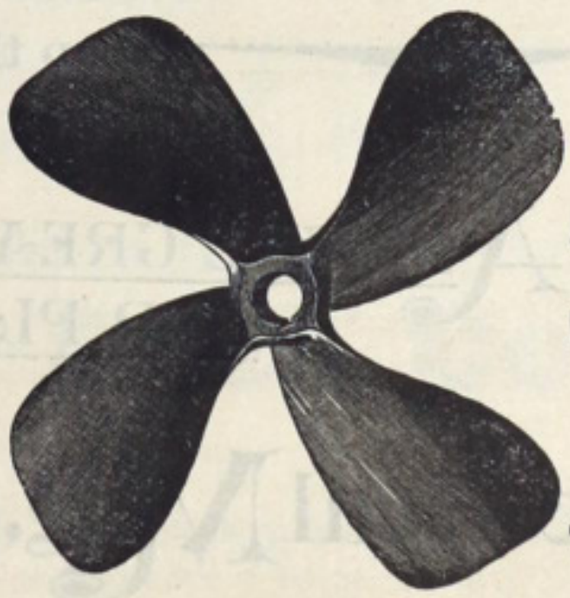

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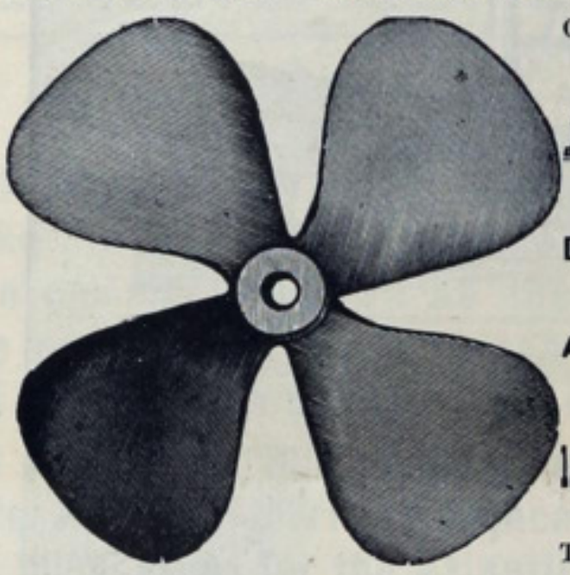

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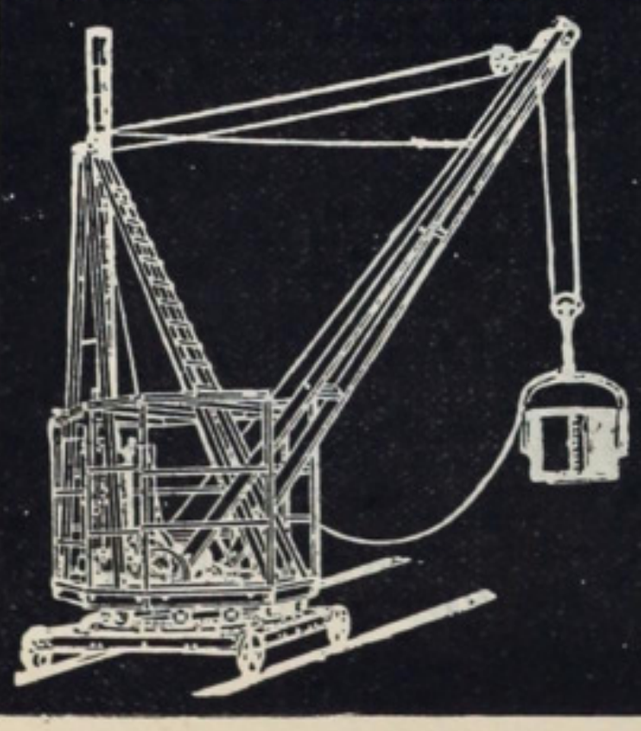

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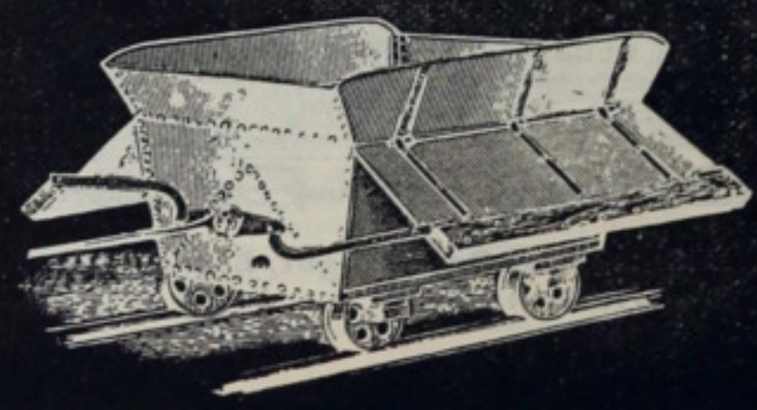

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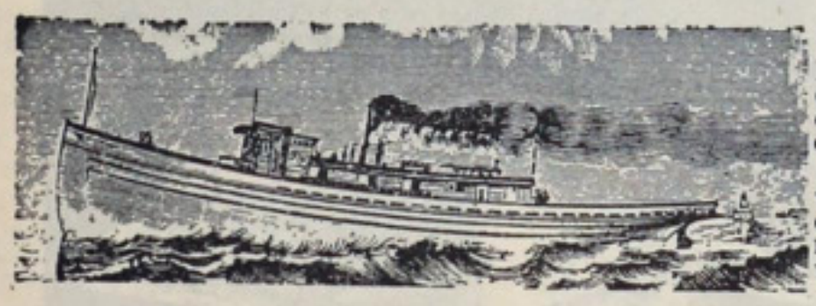

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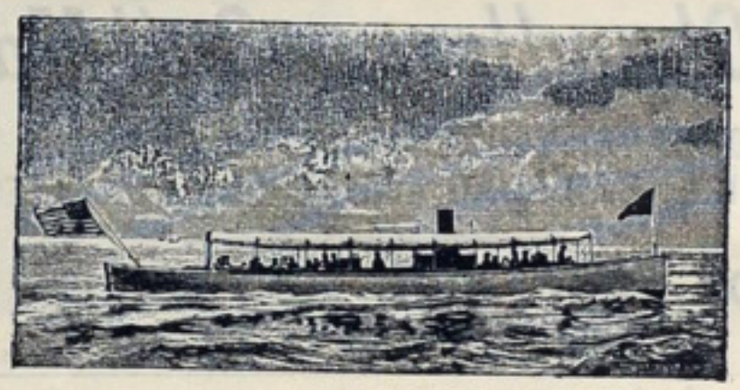

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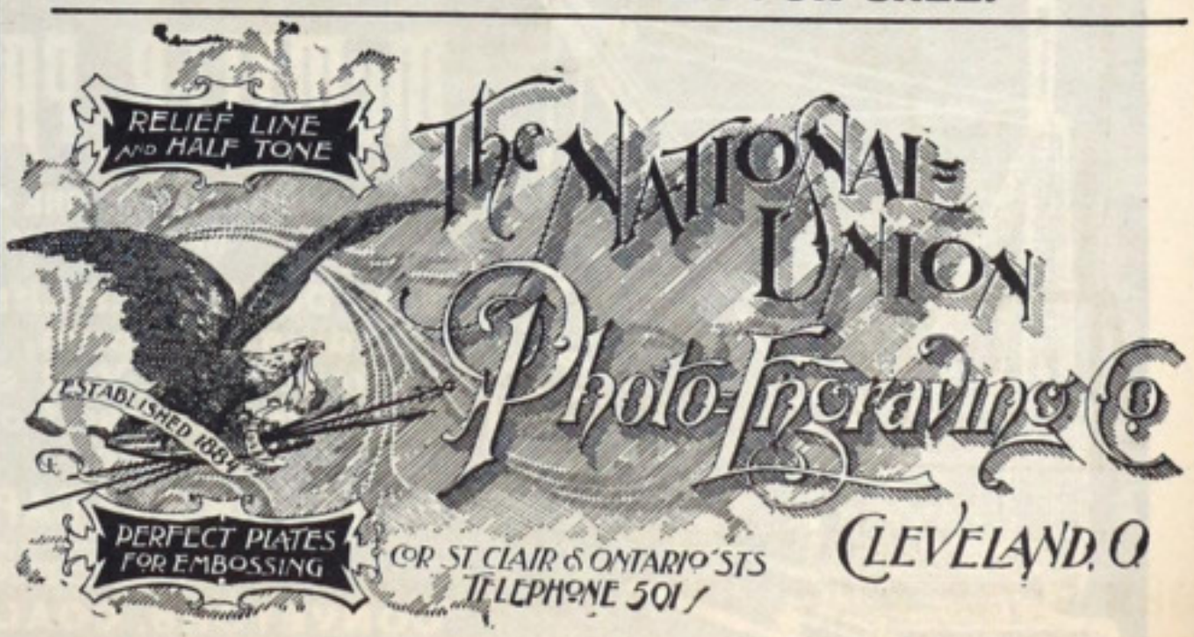

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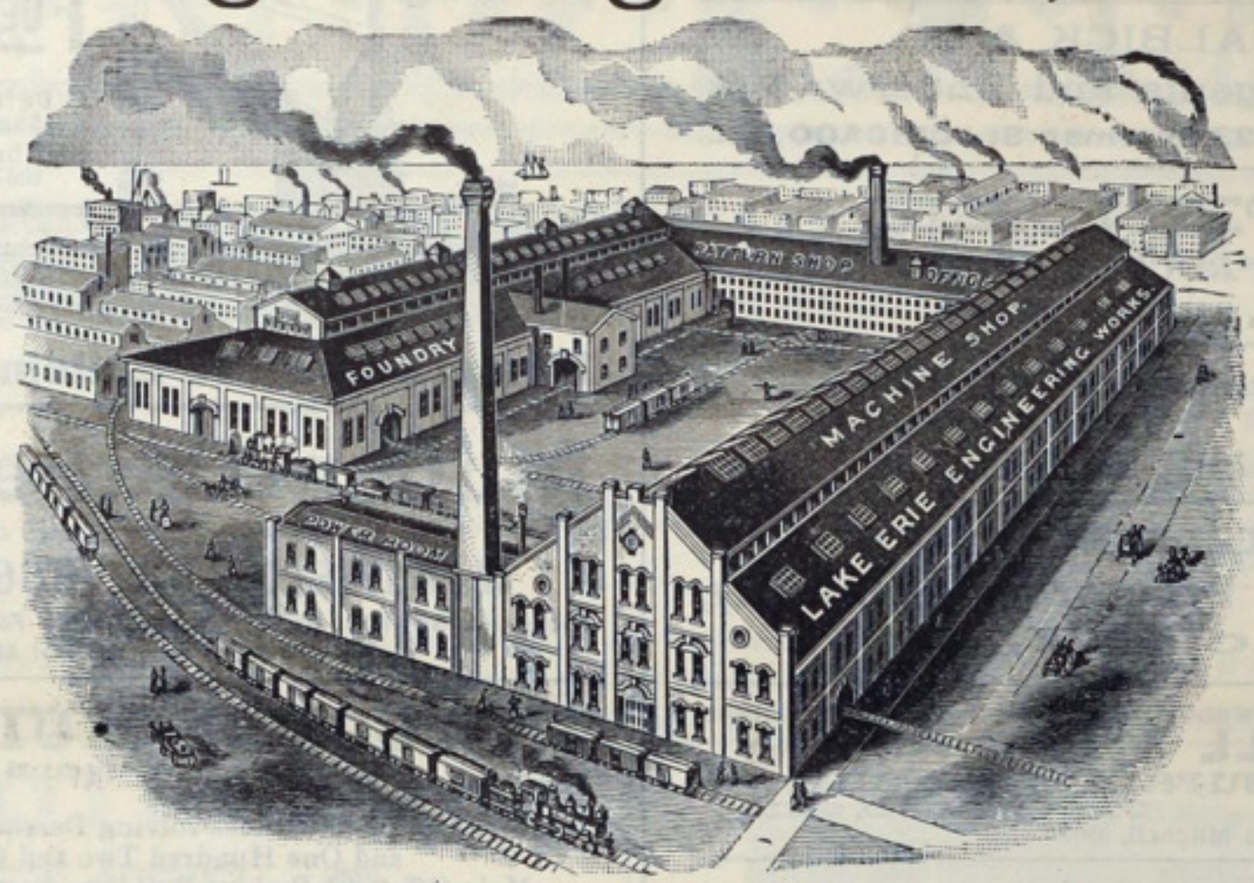

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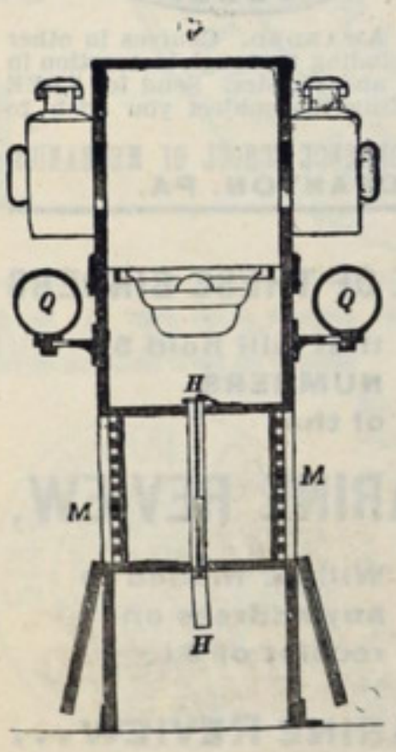

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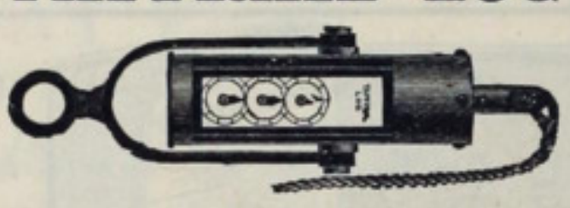

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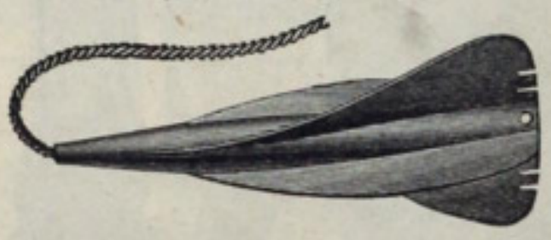

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OFFICE OF LIGHT-HOUSE BOARD, Washington, D. C., March 11, 1895. Sealed proposals will be received at this office until 2 o'clock P. M. on Thursday, the 11th day of April, 1895, for furnishing the materials and labor of all kinds necessary for the construction and delivery of one first-class composite Light-Vessel No. 66 for a fixed sum for said vessel delivered. Forms of proposals, plans, and specifications, showing what is required, can be had or seen by applying to this office. The right is reserved to reject any or all bids and to waive any defects. JOHN G. WALKER, Rear-Admiral, U. S. N., Chairman. 21

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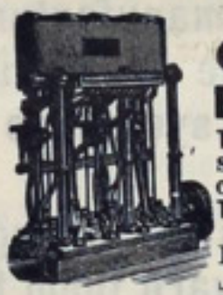
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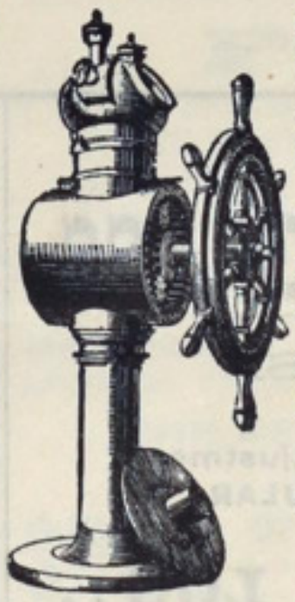
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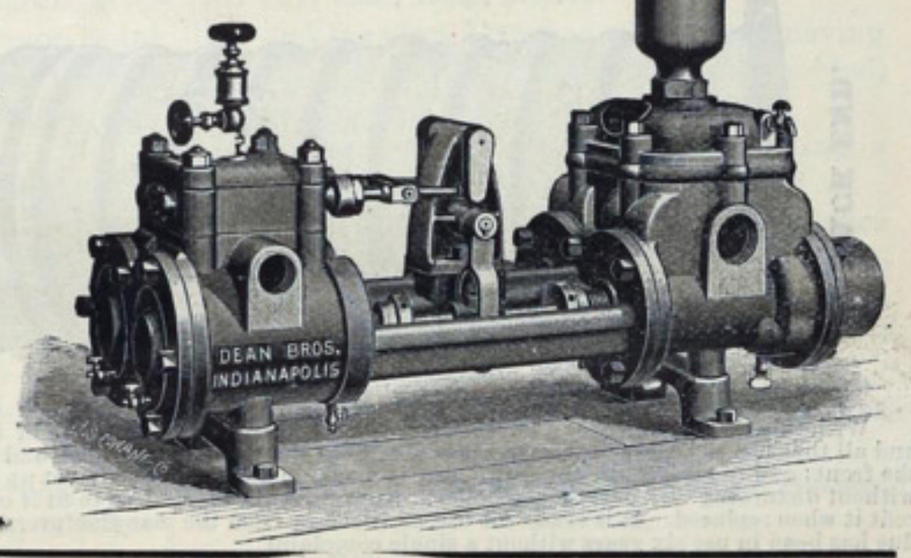

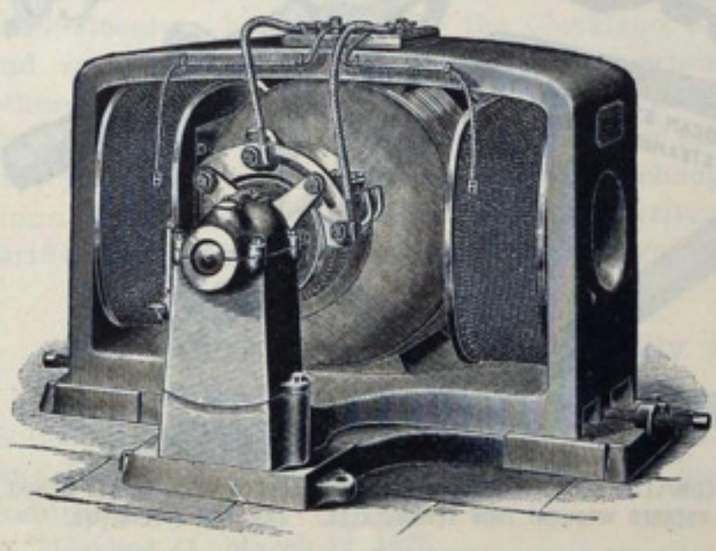

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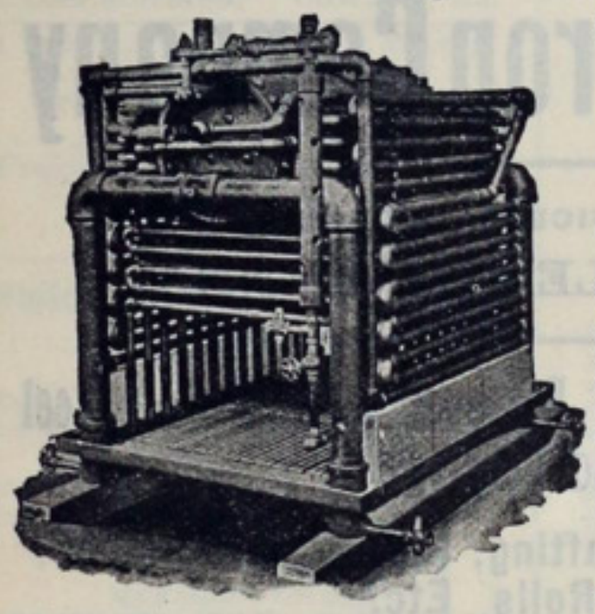

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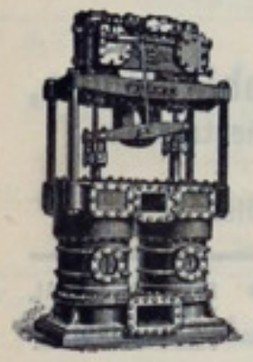

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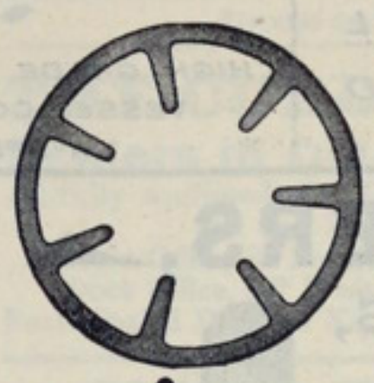

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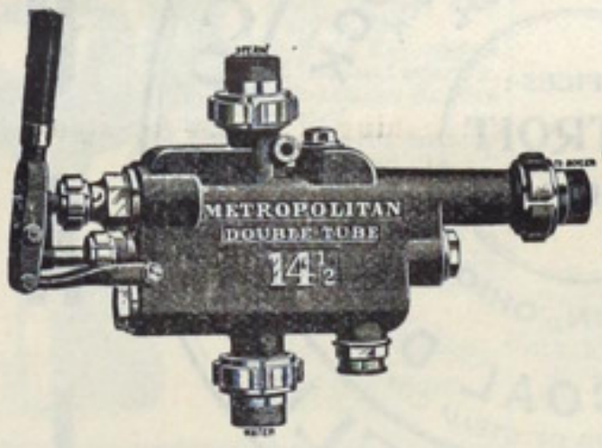

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